

REMARKS

Applicants respectfully request reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow. After amending the claims as set forth above, claims 4-5, 8, 16-18, and 21-28 are now pending in this application.

Applicants wish to thank the Examiner for the careful consideration given to the claims.

Claims 4-5, 8, 16-18, and 21-28 based on 35 U.S.C. 112

Claims 4-5, 8, 16-18, and 21-28 are rejected under 35 U.S.C. 112, second paragraph, for a various informalities. Although Applicant believes the rejections to be improper, claims 4, 8, 16, and 18 have been amended in response to this rejection in order to expedite prosecution.

As to claims 24 and 27, it is alleged that the recitation of “the at least one of the first and second wires, the substrate, and the counter substrate” is indefinite; the recitation is not defined by the claim; the specification does not provide a standard for ascertaining the requisite degree; one of ordinary skill in the art would not be reasonably apprised of the scope of the invention; and it is unclear to one having ordinary skill in the art whether the spacer must be in direct physical contact with both of the “first and second wires,” or rather if contact with only one of the two wires would suffice. (Paragraphs 14-15 of the Office Action.) It is respectfully submitted that the recitation “the at least one of the first and second wires” is definite, clear, and one having ordinary skill in the art would ascertain the scope of the invention. Indeed, the phrase “the at least one of the first and second wires” is merely referring to a previous element recited in claims 4 and 16, respectively.

For example, claim 4 recites “wherein the spacer is in direct physical contact with the entire predetermined surface of at least one of the first and second wires such that no portion of the at least one of the first and second wires is in direct physical contact with the liquid crystal layer.” Similarly, claim 16 recites “wherein the spacer is in direct physical contact with the entire predetermined surface of at least one of the first and second wires such that no portion of the at least one of the first and second wires is in direct physical contact with the liquid crystal layer.” One with ordinary skill in the art would know meaning of such plain language and ascertain the scope of the claim based on such language.

For at least these reasons, favorable reconsideration of the rejection is respectfully requested.

Rejection of claims 4, 5, 16-17, and 21-28 based on the IADPA and Watanabe

Claims 4, 5, 16-17, and 21-28 are rejected under 35 U.S.C. 103(a) as being anticipated by the IADPA in view of U.S. Patent 5,150,239 (“Watanabe”). This rejection is traversed for at least the following reasons.

Claim 4 (as amended) recites, among other things, a plurality of data lines; a plurality of scan lines; a first wire electrically connected to one of the scan lines; a second wire; a second substrate; a liquid crystal layer disposed between the first and second substrates; and a spacer disposed between the first and second substrates. The spacer prescribes the thickness of the liquid crystal layer. The spacer is in direct physical contact with the entire predetermined surface of at least one of the first and second wires such that no portion of the at least one of the first and second wires is in direct physical contact with the liquid crystal layer. Claim 16 recites similar and/or analogous features. The IADPA, Watanabe, or any combination thereof does not teach or suggest this combination of features.

For example, Fig. 10 of the IADPA clearly shows that the liquid crystal layer 50 contacts a portion of wire 47. Furthermore, the spacer 51 of IADPA can only prescribe the distance between the substrate and the counter substrate, but is not in direct physical contact with the entire predetermined surface of at least one of the first and second wires.¹ Thus, the IADPA does not teach a spacer that is in direct physical contact with the entire predetermined surface of at least one of the first and second wires such that no portion of the at least one of the first and second wires is in direct physical contact with the liquid crystal layer and that prescribes the second distance between the substrate and counter substrate.²

Watanabe does not cure the deficiencies of the IADPA because Watanabe does not teach or suggest a spacer that prescribes the thickness of the liquid crystal layer and that is in direct physical contact with the entire predetermined surface of at least one of the first and second wires such that no portion of the at least one of the first and second wires is in direct physical contact with the liquid crystal layer. The PTO states that Watanabe discloses an

¹ The predetermined surface being a surface that does not directly abut the first substrate and is disposed on a side of the first substrate that directly abuts the liquid crystal layer.

² The PTO asserts that the Applicant “appears...to potentially be conceding that the IADPA provides such a great degree of functionality on its own that the secondary reference of Watanabe is wholly unnecessary.” (Page 15 of the Office Action.) Applicant flatly rejects such an assertion. Applicant maintains that the structure of IADPA is quite different from the structure of claims 4 and 16, and is patentable over the teachings of IADPA, Watanabe, and any combination thereof. Applicant was merely commenting that the IADPA teaches a spacer 51, and the assertion that one with ordinary skill in the art would use the insulating layer 104 of Watanabe as a spacer is improper because the spacer 51 of IADPA already provides the function of a spacer so why would one with ordinary skill in the art search out and use the insulating layer 104 for use as a spacer?

insulator [Fig. 1; 104] which inherently takes up space, and thereby fully qualifies as a spacer. (Pages 16-17 of the Office Action.) However, the insulating layer 104 of Watanabe cannot prescribe the thickness of the liquid crystal layer because no matter how thick the insulating layer 104 is, the thickness of the liquid crystal layer will not be influenced. Indeed, the thickness of the liquid crystal layer 107 of Watanabe depends on the spacer 108 of Watanabe. Accordingly, the insulating layer 104 of Watanabe cannot be considered as the spacer of claim 4 or claim 16.

Also, the rejection based on the IADPA and Watanabe is improper the proposed combination would make the device of the IADPA inoperable if the insulating layer 104 of Watanabe is used as proposed by the PTO. Because the spacer of claim 4 or 16 needs to prescribe the thickness of the liquid crystal layer, it means that the spacer shall span and maintain the gap for filling the liquid crystal layer therein. If we combine the spacer 51 of the IADPA (that spans and maintains the gap for filling the liquid crystal layer therein) with the insulating layer 104 of Watanabe (that extends along the entire surface of the substrate), the spacer will span the gap along the entire surface of the substrate, and therefore there will be no place for the liquid crystal layer. In other words, if the insulating layer 104 of Watanabe is used in the device of the IADPA, the entire surface of the substrate will be covered. If such a layer is used to prescribe the thickness of the liquid crystal layer (i.e., expand towards the counter substrate), the entire gap between the substrate and the counter substrate will be filled with the insulating layer. As a result, there is no room left for the liquid crystal layer. Accordingly, one with ordinary skill in the art would not consider using the insulating layer 104 of Watanabe for prescribing the thickness of the liquid crystal layer because it would prevent any gap for the liquid crystal layer to be placed, thus making the device of IADPA inoperable. Such a modification is not obvious because a proposed combination cannot be obvious if it makes the device of the primary reference inoperable. (See MPEP 2145³, 2143.01⁴.)

In rebuttal to the above argument, the PTO asserts that Watanabe discloses one place for a liquid crystal layer and cites element 107 in Fig. 1 and column 3, lines 23-35 of Watanabe. (Page 15 of the Office Action.) However, the above argument is addressing the

³ “[T]he claimed combination cannot change the principle of operation of the primary reference or render the reference inoperable for its intended purpose.”

⁴ “If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984”).

device of the IADPA as modified by Watanabe, as suggested by the PTO. The proposed combination will not have the liquid crystal layer for the reasons outlined above because of the PTO's suggest modification of the device of the IADPA. The fact that Watanabe discloses a liquid crystal layer does not address this proposed modification of the device of the IADPA. Indeed, because the PTO's modification widens the width of the spacer 51 of the IADPA so as to be as wide as the insulating layer 104 of Watanabe (even though the Applicant maintains such a modification is improper), there is no gap for the liquid crystal layer to be filled therein because the insulating layer has encompassed the gap between the two substrates. Thus, the proposed combination of IADPA and Watanabe could not include the liquid crystal layer. In other words, the PTO is arguing that the individual reference IADPA teaches the liquid crystal layer when the proposed modification of the IADPA would eliminate such a feature. Accordingly, the proposed combination of IADPA and Watanabe would not teach or suggest all the features of claims 4 or 16 (i.e., the liquid crystal layer), as well as being an improper modification.

Furthermore, the rejection based on the IADPA and Watanabe is improper because the proposed combination would change the function of the insulating layer 104 of Watanabe if the insulating layer 104 of Watanabe is used to prescribe the thickness of the liquid crystal layer. Indeed, the insulating layer cannot be considered prescribing a thickness of the liquid crystal layer because no matter how thick the insulating layer 104 is, the thickness of the liquid crystal layer 107 will not be influenced. Furthermore, the spacer 108 of Watanabe is clearly used for prescribing the thickness of the liquid crystal layer. The PTO asserts that the spacer 51 of the IADPA and the insulating layer 104 of Watanabe are used for the same purpose of preventing/limiting electricity. Applicant respectfully disagrees because the purpose of the spacer 51 of the IADPA is prescribing the distance between the substrates, as clearly stated in page 21, lines 14-15 of the specification, which is the same as the spacer 108 of Watanabe. To use the insulating layer 104 of Watanabe for prescribing the thickness of liquid crystal layer is clearly using the insulating layer 104 for a different purpose, a situation quite different from *Ex parte Smith*, Board of Patent Appeals and Interferences (decided June 25, 2007) (precedential decision). In *Smith*, a rejection based on obviousness was upheld

because the elements that were combined from various references did not change their respective functions,⁵ which is not the case here. Thus, the obvious rejection is improper.

Furthermore, the PTO guidelines suggest that the combination is not obvious because of the change in function of the insulating layer 104 of Watanabe. In particular, the PTO guidelines provide that a finding of obviousness based on combining prior art elements according to known methods to yield predictable results is not established if there is no finding that each element merely would have performed the same function as it did separately. (Page 57529, vol. 72, No. 195 of the Federal Register.)

Because the function of the insulating layer 104 of Watanabe would change if used as a spacer prescribing the thickness of the liquid crystal layer, the obvious rejection is improper, and should be withdrawn.

The PTO provides seven rationales for making the proposed combination on pages 8-10 of the Office Action, which are all improper, as discussed below.

First, the PTO asserts that it would have been obvious to place the insulating layer 104 of Watanabe in direct physical contact with the entire exposed surface of at least one of a first and second wires of the IADPA so as to provide the entire panel uniformly with a prescribed gap and for fixing the alignment of the pair of substrates. It is respectfully submitted that the proposed motivation is not sufficient because the spacer 51 of the IADPA already provides this function, and the insulating layer 104 of Watanabe does not (which is why Watanabe requires spacers 108) so there is no logical reason why one with ordinary skill in the art would consider the insulator layer of Watanabe to fulfill this function when a different element is required to perform it. Furthermore the insulating layer 104 of Watanabe does not even provide this proposed benefit but the spacer 108 of Watanabe does. In response to this argument, the PTO merely repeats the assertion without addressing Applicant's comments, which is improper.

Second, the PTO asserts that it would have been obvious to place the insulating layer 104 of Watanabe in direct physical contact with the entire exposed surface of at least one of a first and second wires of the IADPA because all the claimed elements were known in the prior art and one skilled in the art could have combined the elements with no change in their respective functions. However, as outlined above, the insulating layer 104 of Watanabe and

⁵ “[E]ach of the elements of Wyant, Dick, and Ruebens combined by the Examiner performs the same function when combined as it does in the prior art. Thus, such a combination would have yielded predictable results.” *Ex Parte Smith* at 22.

the spacer 51 of the IADPA perform different functions and to substitute the insulating layer 104 of Watanabe for the spacer 51 of the IADPA changes the function of the insulating layer. Accordingly, a rejection based on these grounds is improper.

Third, the PTO asserts that it would have been obvious to place the insulating layer 104 of Watanabe in direct physical contact with the entire exposed surface of at least one of a first and second wires of the IADPA because the substitution of one known insulator layer for another would have yielded predictable results. However, the insulating layer 104 of Watanabe is not a spacer (as Watanabe teaches the use of spacers 108) and the spacer 51 of the IADPA is not an insulating layer as a portion of the surface wire on which it is disposed is exposed. One of skill in the art would not understand the insulating layer 104 of Watanabe and the spacer 51 of the IADPA to be equivalent because they are used for different purposes. Furthermore, one with ordinary skill in the art would not view the insulator layer 104 of Watanabe as a suitable substitute for the spacer 51 of the IADPA because Watanabe, itself, teaches the use of the spacers 108 and the insulating layer 104. If they are equivalent and can provide the same function, why would you need both? The PTO rebuts this argument by asserting that it is not attempting to suggest or argue the obviousness of substituting one element of Watanabe for another element of Watanabe, which Applicant has not argued. Applicant has argued that one skill in the art would not view the insulating layer 104 of Watanabe as a suitable substitute for the spacer 51 of the IADPA because they are used for different purposes.

Fourth, the PTO asserts that it would have been obvious to place the insulating layer 104 of Watanabe in direct physical contact with the entire exposed surface of at least one of a first and second wires of the IADPA because the technique for improving a particular class of devices was part of the ordinary skill in the art in view of the teaching of the technique for improvement in other situations. However, there is no teaching that the insulator layer of Watanabe improves the function of a spacer for prescribing the thickness of a liquid crystal layer. Thus, there is no showing of the use of the technique of supplying the insulating layer as a spacer in other situations.

Fifth, the PTO asserts that it would have been obvious to place the insulating layer 104 of Watanabe in direct physical contact with the entire exposed surface of at least one of a first and second wires of the IADPA because the technique of providing insulation around wires was recognized as part of the ordinary capabilities of one skilled in the art. However, there is no teaching that the insulating layer is a known technique for prescribing the

thickness of a liquid crystal layer. Thus, there is no showing that providing an insulating layer as the spacer is within the ordinary capabilities of one skilled in the art.

Sixth, the PTO asserts that it would have been obvious to place the insulating layer 104 of Watanabe in direct physical contact with the entire exposed surface of at least one of a first and second wires of the IADPA because a person of ordinary skill has good reason to pursue known options of providing insulation within his or her technical grasp if this leads to the anticipated success. However, the PTO has not established that there is a finite number of known options and how one skilled in the art would come by these known options. The mere assertion that an artisan would not be overwhelmed by an infinite number of options is merely a conclusory statement with no evidentiary support.

Seventh, the PTO asserts that it would have been obvious to place the insulating layer 104 of Watanabe in direct physical contact with the entire exposed surface of at least one of a first and second wires of the IADPA because design incentives and market forces provided a reason to make the adaptation. However, there is no teaching that the insulating layer is used as a spacer. The reason for the modification (for example, design incentives or market forces) is not a substitute for providing prior art disclosing all the features of the claims.⁶ Also, no teaching or evidence has been set forth showing these “design incentives or market forces” but the PTO merely asserts a conclusory statement.

Because no combination of the IADPA and Watanabe teaches or discloses all the features of claim 4 and 16 and the combination is improper, claims 4 and 16 are not rendered unpatentable over the prior art.

Claims 5, 17, and 21-22 depend from and have all the limitations of either claim 4 or claim 16, and are allowable for at least the reasons set forth above without regard to the further patentable features contained therein.

Special note is made of the rejection of claims 23, 25-26 and 28. Claims 23, 25-26 and 28 require the liquid crystal layer to contact one of the first and second wires or both substrates. But if the insulating layer 104 of Watanabe covers an entire substrate including the wires in the device of the IADPA, as asserted by the PTO, it is not possible for the liquid

⁶ Indeed, the Supreme Court in *KSR Int'l Co. v. Teleflex, Inc.* has not removed the requirement that the prior art reference (or references when combined) must teach or suggest all the claim limitations. In fact, KSR emphasized cases where all features are known. For example, the Supreme court noted three cases *United States v. Adams*, 383 U.S. 39 (1966), *Anderson's-Black Rock, Inc. v. Pavement Salvage Co.*, 396 U.S. 57 (1969), and *Sakraida v. AG Pro, Inc.*, 425 U.S. 273 (1976), which all dealt with the issue of whether known elements combined together would be obvious. These statements reinforce the concept that the elements of the claim have to be known in the art before they are determined to be combinable or not.

crystal layer to contact either wire (as required by claims 23 and 26) or both substrates (as required by claims 25 and 28). Thus, the proposed modification of IADPA and Watanabe does not teach or suggest these features either. It is noted that the PTO attempts to argue that these features are disclosed because the IADPA discloses the liquid crystal layer is in contact with the two substrates and one of the first and second wires. However, the PTO based these assertions on the teachings of the IADPA before being modified by Watanabe as suggested by the PTO. However, the modified device of the IADPA would eliminate the liquid crystal layer being in contact with either wire (as required by claims 23 and 26) or with both substrates (as required by claims 25 and 28) (as explained above) because the insulating layer 104 of Watanabe covers an entire substrate including the wires. Accordingly, claims 23, 25-26, and 28 are allowable for at least these additional reasons.

For at least these reasons, favorable reconsideration of the rejection is respectfully requested.

Rejection of claims 8 and 18 based on the IADPA, Watanabe and Kwon

Claims 8 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over the IADPA and Watanabe in view of U.S. Patent 6,486,930 (“Kwon”). Claims 8 and 18 depend from and have all the limitations of either claim 4 or 16. As previously mentioned, no combination of the IADPA and Watanabe teaches all the features of claims 4 and 16 and the combination is improper. Kwon fails to cure these deficiencies. For at least these reasons, favorable reconsideration of the rejection is respectfully requested.

Conclusion

Applicants believe that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check or credit card payment form being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

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